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### MINI

#### (57)[Claim(s)]

(A) An organic polymer which has a hydroxyl group or a hydrolytic basis combined with a silicon atom, potassium, carboxylic acid barium, carboxylic acid manganeae, a hardenability constituent containing and has at least one silicon content group which can construct a bridge by forming a siloxane bond, (B) Carboxylic acid titanium, carboxylic acid vanadium, carboxylic acid titanium, carboxylic acid

one or more sorts of carboxylic acid metal salt chosen from carboxylic acid nickel. Claim 2

 The hardenability constituent according to claim 1 which becomes considering an amine compound as an easential ingredient as an ingredient. A) A number average molecular weight is within the limits of 500-50,000, and an organic polymer of an ingredient is a general formula to an end and/or a side chain of a main chain (1). :

Claim 3

Formula 1



Ξ

numbers 1-20. It is the Tori ORGANO siloxy group shown by the anyl group of the carbon numbers 8sydroxyl group or a hydrolytic basis independently, respectively. a is 0, 1, 2, or 3, b is 0, 1, or 2, and a the inside of a formula, R1, and R2 -- respectively -- independent -- the alkyl group of the carbon insubstituted hydrocarbon group of the carbon numbers 1-20 independently, respectively). X is a 20, the aralkyl group of the carbon numbers 7-20, or (R) signo-(R' is the substitution or the

he hardenability constituent according to claim 1 or 2 coming out and having one or more hydrolytic and b are not aimultaneously set to 0, m is an integer of 0, or 1-19. silyl groups per molecule expressed.

The hardenability constituent according to claim 3, wherein X is an alkoxy group

(A) A hardenability constituent given in any 1 paragraph of Claims 1-4 whose organic polymers of an ingredient are a polyoxyalitylene series polymer and/or a saturated hydrocarbon system polymer. [Claim 5]

The hardenability constituent according to claim 5 which is a polymer, wherein said saturated hydrocarbon system polymer has a repeating unit resulting from isobutylene 50% of the weight or nore in a total amount. Claim 6

hardenability constituent given in any 1 paragraph of Claima 1–8 to which carboxylic acid potassium, concoylic acid barbur, archboxylic acid mangamese, and certoxylic acid intoles use as the main impresients cardoxylic acid metal salt expressed with general formula (2), (3), and (6) – (10). B) Carboxylic acid calcium of an Ingredient, carboxylic acid vanadium, carboxylic acid Utanium, A

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3a(OCOR) 2 (2) /(OCOR) 3 (3) TI(0COR) , (6)

Ba(OCOR) 2 (8) ((OCOR) (7)

(The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a carbon carbon double bond.) nickel(OCOR) 2 (10) Mn(OCOR), (9)

salt of an ingredient is the carboxylic acid metal salt in which the melting point has an acid radical of (B) The hardenability constituent according to any one of claims 1 to 7 whose carboxylic acid metal carboxylic acid which is 65 \*\* or less.

metal salt which has an acid radical of carboxylic acid whose carbon numbers in which carboxylic acid (B) The hardenability constituent according to any one of claims 1 to 7 which is the carboxylic acid metal salt of an ingredient contains carbon of a carbonyl group are 2-17.

carboxylic acid group contant compound in which carboxylic acid metal salt of an ingredient is chosen (B) A hardenability constituent given in any 1 paragraph of Claims 1-8 which are metal saft of a from octylio acid, 2-ethylhexanolo acid, neo decanoic acid, oleic acid, or naphthenic acid.

(A) A hardenability constituent given in any 1 paragraph of Claims 1-10 containing the (B) ingredient of quantity which serves as 0.005 - 5 weight section by metallic element conversion contained in the (B) ingredient to ingredient 100 weight section.

(A) A hardenability constituent given in any 1 paragraph of Claims 2-10 containing the (B) ingredient of quantity which serves as 0.005 - 5 weight section by metallic element conversion contained in the B) ingredient, the (C) ingredient 0.01 - 20 weight sections to ingredient 100 weight section.

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### DETAILED DESCRIPTION

Detailed Description of the Invention

n this invention, it has the hydroxyl group or hydrolytic basis combined with the silicon atom, and a Field of the Invention

Therefore, it is related with the hardenability constituent containing the organic polymer which has a silicon content group (henceforth a "reactive silicon group") which can construct a bridgo. siloxane bond is formed.

## Description of the Prior Art]

t is known that the organic polymer which contains at least one reactive silicon group in a molecule as the interesting character in which construct a bridge by formation of the siloxane bond

accompanied by the hydrolysis reaction of a reactive silicon group, etc., and a rubber-like hardened naterial is obtained with hygroscopic surface moisture etc. also in a room temperature.

In the polymer which it has, these reactive sillicon groups a polyoxyalkylene series polymer and a polyisobutylene system polymer, it is indicated by JP,S52-73998,A, JP.H5-125272A, JP.H3-72527A, JP,S63-6003,A, JP,S63-6041,A, JP,H1-38407,A, JP,H8-231758,A, ctc.

produced industrially, and are widely used for uses, such as a sealing material, adhesives, and a paint. Especially a polyoxyalkylene series polymer and a polyisobutylene system polymer are already

used for a structural scaling material, the sealing material for multiple glass, etc., it is effective. The neat resistance, a water resisting proparty, weatherability, etc., if the hardened matarial obtained is sobutylene system polymer which has a repeating unit which furthermore originates in isobutylane 50% of the weight or more in a total amount is preferred as a sealant aiming at moistura proof from especially the thing to excel in low moisture permeability and low gas permeability. When an organic polymer is a saturated hydrocarbon system polymer especially, since it excels in

such a sealing material generally fills up the joined part and crevice between various members, the

flattery nature to the use part ranging from being used to a long period of time in order to give waterlight and airtightness becomes very important, and revealing sufficient elongation and intensity is called for.

ethyllexanole acid) tin, The tin scrios catalyst represented by starvalent tin, such as dibutkfrin ethyllexanole acid) tin, The tin scrios catalyst according to the part which places especially seasonable is large, alone the hardened matched which has stability is obtained, many divolent tin seasing material is large, alone the hardened matched which has stability is obtained, many divolent tin. purpose of a silanol condensation catalyst being used for bridge construction hardening of an organic condensation reaction. As such a silanol condensation catalyst, divalent tin, such as octylic acid (2-Amine compounds, such as lauryl amine, are used together as a co-catalyst in many cases for the polymer which, on the other hand, has such a reactive silicon group, and also accelerating a

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clongation of a hardened material which are acquired may be insufficient, and an improvement of the compound of a co-catalyst and is used as a curing catalyst of the (A) ingredient, the intensity and However, when octylic acid tin which is divalent tin, for example is used together with the amine further physical proparties is dasired.

nardened material obtained has emollience, i.e., having the character to follow to the long-term stress Although most is a dibutyltin type, the latter tetravalent tin saries catalyst being used now, Whila the catalyst of 1 liquid mold-curing nature constituent. However, since toxicity in case a small amount of change from the outside and fast curability, it is broadly used from the ability to apply as a curing tributyltin contains in this is regarded as questionable, development of the silanol condensation catalyst of a non-tin series is desired.

organopolysiloxane constituent, the carboxylic acid metal salt of various kinds of non-tin is indicated with carboxylate of tin. As an example in which the carboxylic acid metal salt of non-tin was used for 12860,A) and carboxylic acid oerium (JP,2000-313814,A), there was no example broadly examined in the curing catalyst of the constituent which, on the other hand, contains the organic polymer which In JP,S35-2795,B, JP,S32-3742,B, JP,S35-9639,B, JP,S37-3271,B, etc., As a curing catalyst of an has a reactive silicon group, Although there were carboxylic acid bismuth (JP,H5-39428,A, JP,H9-

[Problem(s) to be Solved by the invention] The purpose of this invention is as follows.

various carboxylic acid metal aalt until now.

Provide a hardenability constituent useful as the structural sealing material asked especially for high durability, the sealing material for multiple glass, the moisture seal material used for an electric electronic component, adhesives, etc. from revealing the outstanding intensity and elongation. Have practical hardenability and stability with a good hardened matarial obtained.

## Means for Solving the Problem

In order that this invention persons may solve such a problem, as a result of inquiring, as a curing cetalyst of the (A) ingredient Carboxylic acid calcium, Carboxylic acid vanadium, carboxylic acid iron. oarboxylic sold cobalt, and a carboxylic sold zirconium, Securing moderate hardenability and stability, carboxylic acid titanium, carboxylic acid potassium, By using one or more sorts of carboxylic acid it finds out revealing high intensity and the physical properties of high clongation compared with a metal salt chosen from carboxylic acid barium, carboxylic acid manganese, carboxylic acid nickel, case where octylic soid tin is used as a curing catalyst, and came to complets this invention.

forming a siloxane bond, (B) It is ralated with a hardanability constituent containing ona or more sorts Namely, this invention has a hydroxyl group or a hydrolytic basis combined with the (A) silicon atom. An organic polymer which has at least one silloon content group which can construct a bridge by of carboxylic acid metal salt chosen from carboxylic acid calcium, carboxylic acid vanadium, carboxylic soid titanium, carboxylic acid potassium, carboxylic acid barium, carboxylic acid

manganese, and carboxylic acid nickel.

An amine compound is related with the aforementioned hardenability constituent which becomes as an essential ingredient as a (C) ingredient. As a desirable embodiment, a number average molecular weight is within the limits of 500-50,000, and an organic polymer of the (A) ingredient is a general formula to an end and/or a side chain of a main

Formula 2

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numbers 1-20. It is the Torl ORGANO siloxy group shown by the aryl group of the carbon numbers 6he inside of a formula, R<sup>1</sup>, and R<sup>2</sup> — respectively — independent — the alkyl group of the carbon 20, the arallyl group of the carbon numbers 7-20, or (R) siO- (R' is the substitution or the

ydroxyl group or a hydrolytlo basis independently, respectively. a is 0, 1, 2, or 3, b is 0, 1, or 2, and a nardenability constituent given in said either having one or more hydrolytic silyl groups per molecule and b are not simultaneously set to 0. m -- the integer of 0, or 1-19 -- it is -- it is related with a insubstituted hydrocarbon group of the carbon numbers 1-20 independently, respectively). X is a

it is related with the aforementioned hardenebility constituent characterized by X being an alkoxy

group as a desirable embodiment.

As a destrable embodiment, an organic polymar of the (A) ingredient is related with a hardanability constituent given in said either which is a polyoxyalkylene series polymer and/or a saturated

hydrocarbon system polymer,

aforementioned hardenability constituent which is a polymer having a repeating unit resulting from As a desirable embodiment, said saturated hydrocarbon system polymer is related with the

As a desirable embodiment, carboxylic acid calcium of the (B) ingredient, Carboxylic acid vanadium, isobutylene 50% of the weight or more in a total amount.

earboxylic acid titanium, cerboxylic acid potassium, Carboxylic acid barlum, carboxylic acid manganese, and carboxylic acid nickel are related with a hardenability constituent given in said oither which uses as the main ingredients carboxylic acid metal saft expressed with general formula (2), (3),

and (6) - (10), respectively. 3a(OCOR) 2 (2)

(OCOR) 3 (3)

(OCOR) 4 (6)

3a(OCOR) 2 (8) ((000RX7)

Mn(OCOR), (9)

The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a rickel(OCOR) 2 (10)

As a desirable embodiment, carboxylic acid metal salt of the (B) ingredient is releted with a hardenability constituent given in said either which is the carboxylic acid metal salt in which the nelting point has an acid radical of carboxylic acid which is 65 \*\* or less. carbon carbon double bond.)

As a desirable embodiment, a carbon numbor in which carboxylic acid metal salt of the (B) ingredient contains carbon of a carbonyl group is related with a hardenability constituent given in said either which is the carboxylic acid metal salt which has an acid radical of carboxylic acid which is 2-17.

hardensbility constituant given in said either which is metal sait of a carboxylic sold group content is a desirable embodiment, carboxylic acid metal salt of the (B) ingredient is related with a

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JP,4150220,B [DETAILED DESCRIPTION]

compound chosen from octylic acid, 2-ethylhaxanoic acid, neo decanoic acid, oleic acid, or naphthanic acid.

quantity which sarves as 0,005 - 5 weight section by metallio element conversion contained in the It is related with a hardenability constituent given in asid aithar containing the (B) ingredient of (B) ingredient to (A) ingredient 100 weight section as a desirable embodiment.

quantity which serves as 0.005 - 5 weight section by metallic element conversion contained in the (B) ingredient, the (C) ingredient 0.01 - 20 weight sections to (A) ingredient 0.01 - 20 weight section as a It is related with a hardenability constituent given in said either containing the (B) ingredient of desirable embodiment.

Hereafter, this invention is explained in detail. Embodiment of the Invention

Restriction in particular does not have a principal chain skeleton of an organic polymer which has a reactive silicon group used for this invention, and it can use a thing with various kinds of principal ohain skeletons.

condensation polymarization of epsilon-aminoundecanoic acid, Condensation polymerization is carried Polysulfide system polymer, Nylon 610 by the condensation polymerization of the nylon 6 by the ring out from polyamide system polymer, for example, bisphenol A, and the carbonyl chlorides which have opening polymerization of epsilon caprolactam, hexamethylenediamine, Nylon 66 by the condensation polyisoprene, isoprene or butadiene, acrylonitrile, styrene, etc., Hydrocarbon system polymers, such polyolefine system polymers. Condensation with dibasic acid, such as adipic acid, and giycol, Or the as a hydrogenation polyolefine system polymer produced by hydrogenating polybutadienes or these a two or more-ingredient ingredient among Nylon 12 by the ring opening polymerization of epsilonester produced by carrying out the radical polymerization of the monomers, such as ethyl acrylate polyester system polymer obtained by the ring opening polymerization of lactone; The polyacrylic ester, such as ethyl acrylate and butyl acrylate, vinyl acetate, acrylonitrile, methyl methacrylate, amino RAURO lactam, and the above-mentioned nylon, auch as copolyamide. The polycarbonate and butyl acrylate, Vinyl-base polymers, such as an acrylic ester system copolymer with acrylic styrene, etc.; A vinyl monomer is polymerized to said organic polymer. Graft polymer, obtained. polyoxypropylene polyoxy butylana copolymar, An athylene~propylene system copolymer, Tha Specifically A połyoxyethylene, połyoxypropylene, połyoxy butylene, Polyoxy tetramathylen, a połyoxyathylane polyoxypropylene oopolymer, Or połyoxyathylane aaries polymers, such as a copolymer of polyisobutylens, isobutylene, isoprene, etc., polychloroprens, A copolymer with polymerization of adipic acid and hexamethylenediamine, and sebacic acid, Nylon 11 by the

chain skeleton, a polyoxyalkylene series polymer, a hydrocarbon system polymer, a polyester system polymer, a vinyl system copolymer, a polycarbonate system polymer, etc. are preferred. A saturated nydrocarbon system polymer, and a polyoxyalkylene series polymer and a vinyl system copolymer Since acquisition and manufacture are easy among polymers with the above-mentioned principal have a comparatively low glass transition temperature, and their hardoned material obtained is especially preferred from excelling in cold resistance.

system polymer manufactured; a diallyl phthalate system polymer etc. are illustratad.

saturated hydrocarbon system polymers, such as polyisobutylene, hydrogenation polybutadiene, and invention, the reactive silicon group content saturated hydrocarbon system polymer derived from As a saturated hydrocarbon system polymer which has a reactive silicon group used for this

basis which can construct a bridge by formation of the siloxane bond which is a raaction which has The reactive silicon group contained in the organic polymer which has a reactive silicon group is a the hydroxyl group or hydrolytic basis combined with the silicon atom, and is accelerated with the hydrogenation polyisoprene, is raised.

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parboxylic acid metal salt which is the (B) ingradient.

As a reactive allicon group, it is a general formula (1).:



hydrocarbon group of the carbon numbers 1-20 independently, respectively). X is a hydroxyl group or a hydrolytic basis independently, respectively. a is 0, 1, 2, or 3, b is 0, 1, or 2, and a and b are not the inside of a formula,  $\mathbb{R}^1$ , and  $\mathbb{R}^2$  — respectively — independent — an alkyl group of the carbon numbers 6–20. It is the Tori ORGANO siloxy group shown by anyl group of the carbon numbers 6–20. an aralkyl group of the carbon numbers 7-20, or (R') sSiO- (R' is substitution or an unsubstituted imultaneously set to 0. m -- an intager of 0, or 1-19 -- it is -- a basis expressed is raised.

especially as a hydrolytic basis. A basis for which a hydrogen atom, a halogen atom, an alkoxy group, is not limited but what is necessary is just a conventionally publicly known hydrolytic basis

an acyloxy group, a KETOKISHI mate group, an amino group, an amide group, an acid-amide group, an aminooxy group, a sulfhydryl group, an alkenyloxy group, etc. are generally used concrete, for example Among these, although an alkoxy group, an amide group, and an aminooxy group are preferred, a point of hydrolysis nature being quiet and being easy to deal with it to especially an alkoxy group is

4 hydrolytic basis and a hydroxyl group can be combined with one silicon atom in the 1-3 ranges, and a+sigmab) has 1-5 preferred ranges. When a hydrolytic basis and a hydroxyl group join together in two or more ] a reactive silicon group, they may be the same and may differ.

Although a silicon atom which forms a resotive silicon group is one or more pieces, in the case of a silicon atom connected by siloxane bond etc, it is preferred that they are 20 or less pieces.

in particular, it is a general formula (13).:

Formula 4

 $(R^2$  and X are the same as the above among a formula,) c is an integer of 1-3. Since the reactive silicon group expreased is easy to receive, it is preferred. ttp://www4.ipdl.impit.go.jp/cgi-bin/tran\_web\_cgi\_ejje?atw\_u=http%3A%2F%2F%2Fwww4.ipdli... 2010/05/06

JP,4150220,B [DETAILED DESCRIPTION]

sthoxy basis, a propoxy group, and an isopropoxy group, is mentioned for X as an example in case c is aralkyl groups, such as aryl groups, such as cycloalkyl groups, such as alkyl groups, such as a methyl siloxy group R' is indicated to be by 3SiO- which is a methyl group, a phanyl group, etc. (R'), etc. are mentioned. In these, the point that the activity of a hydrolysis reaction is high to especially a methy! In the above-mentioned general formula (13), as an exampla of R<sup>2</sup> in casa c is not 3, For exampla. group and an ethyl group, and a cyclohexyl group, and a phenyl group, and benzyl, the Tori ORGANO In the above-mentioned general formula (13), Tori alkoxy allyl groups, such as a methoxy group, an

disopropoxy methyl silyl group are mentioned. Its activity is high, and since especially the trimethoxysilyl group can reduce quantity of carboxylic acid metal salt which is the (B) ingredient, it is group, a triisopropoxy silyl group, a dimethoxymethyl silyl group, a diethoxymethylsilyl group, and a As more concrete illustration of a reactive silicon group, a trimethoxysilyl group, a triethoxy silyl

What is necessary is just to perform introduction of a reactive silicon group by a publicly known method. That is, the following methods are mentioned, for example.

(b) Make an organic compound which has an active group and an unsaturation group which show

group content epoxy compound. Subsequently, hydrosilane which has a reactive silicon group is made reactivity to an organic polymer which has functional groups, such as a hydroxyl group, in a molacule to this functional group react, and obtain an organic polymar containing an unsaturation group. Or an unsaturation group contant organicity polymer is obtained by copolymerization with an unsaturation to act on an acquired resultant, and it hydrosilylates.

(\*\*) Make a compound which has a sufflydryl group and a reactive silicon group react to an organic polymer containing an unsaturation group produced by making it be the same as that of the (b)

(\*\*) Make a compound which has a functional group and a reactive silicon group which show reactivity to an organic polymer which has functional groups, such as a hydroxyl group, an epoxy group, and an isocyanate group, in a molecule to this functional group react.

group which have a hydroxyl group react to an end a method of (b) or among (\*\*)s from points, like a A method of making a compound which has a polymer, an isocyanate group, and a reactive silicon manufacturing cost bacomes low in the above method is preferred.  As an example of a hydrosilane compound used in a method, For example, trichlorosilane, methyldi chlorosilicane, dimethylchlorosilicane, Halogenation Silang like phenyl dichlorosilane, Trimethoxysilane, KETOKISHI mate)methylsilane are raised, it is not limited to these. Among these, halogenation Silang dimethoxysilane; Methyldi acctoxysilane, The acyloxy sitanes like a phenyldiacetoxysilane; although and alkoxysilane are especially preferred from points, like availability and hydrolysis reaction nature the KETOKISHI mate silanes like bis(dimethyl KETOKISHI mate)methylsilane and bis(cyclohexyl riethoxysilane, methyldiethoxysilana, methyl dimethoxysilane, The alkoxyailane like phenyl

example, etc. are mentioned, it is not limited in particular. As an example of a compound of having radical addition reaction under a radical initiator and/or radical source-of-release existence, for riathoxysilane, gamma-mercapto propylmethyl diethoxysilane, etc. are raisad, it is not limited to (\*\*) Although a method of introducing into an unsaturation binding site of an organic polymer a compound which has a suifhydryl group and a reactive silicon group as a synthetic method by a said sulfhydryl group and a resetive silicon group. For example, although gamma-mercapto propyltrimethoxysilane, gamma-mercaptpropylmethyl dimethoxysilane, gamma-mercaptopropyl

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nethod of making a compound which has a polymer, an isooyanate group, and a reactive alicon group \*\*) Although a method etc, which are shown in JP,H3-47825,A are mentioned, for example as a

particular. As an example of a compound of having said isocyanate group and a reactive silicon group, or axample, although gamna-isooyanate propyltrimethoxyailane, gamna-isocyanate propylmethyl which have a hydroxyl group reacting to an and among synthatic methods, it is not limited in limethoxysilane, gamma-isocyanatepropyl triathoxysilane, gamma-isooyanate propylmethyl

As for a silane compound which three hydrolytic bases have combined with one silicon atoms, such diethoxysilans, etc. are raised, it is not limited to these.

propyltrimethoxysilane. For this reason, when three hydrolytic bases, such as a trimethoxysilyl group, as trimcthoxysilane, disproportionation may advance. If disproportionation progresses, a remarkable dangerous compound [ like ] which is dimethoxysilane will arise. However, such disproportionation use a basis combined with one silicon atom as a silicon content group, it is preferred to use a advances in neither gamma-mercapto propyltrimethoxysilane nor gamma-isocyanate

synthetic method of (\*\*) or (\*\*).

conversion in GPC (gel permeation chromatography), it is preferred that it is 500 to about 50,000, and about 1,000 to 30,000 liquefiad thing which is, carries out and has mobility is especially preferred from exceeded when a number avarage molecular weight is less than 500, since it is lacking in mobility and points, such as the case of dealing with it. If sufficient rubber elasticity is not obtained and 50,000 is (A) A number average molecular weight of an organic polymer which is an ingredient, In polystyrene handling is difficult for it, at ordinary temperature, it is not desirable.

not no longer be obtained, if the number of reactive silicon groups contained in a molecule will be less more pieces, and it is preferred that there are 1.1-5 pieces. Since it will become weak firmly and will become soarce at rubber elasticity if hardenability becomes insufficient, good rubber elasticity may (A) A reactive silion group in one molecule of organic polymers which are an ingredient is one or

may be in both. Since effective network chain density of an organic polymer component contained in a hardened material formed eventually increases capecially when a reactive silicon group is in a main A reactive silicon group may be in a main chain terminal or a side chain of an organic polymer, and chain terminal, it is desirable from points, like a rubber-like hardened material of high elongation than one piece, and five pieces are exceeded, it is not desirable.

Said polyoxyalkylene series polymer is a general formula intrinsically (14). ; [0053] becomes is easy to be obtained with high intensity.

alkylene group of the carbon numbers 1-14.) -- it being a polymer which has a repeating unit shown, among a formula, R<sup>3</sup> is a divalent organic group and is the straight chain shape or the branching, and, R3 in a general formula (14) has the carbon numbers 1-14, and also preferred straight chain shape or branched state alkylene group of 2-4. As the example of the repeating unit shown by a

general formula (14), Formula 6] ittp://www4.ipdlinpit\_go.jp/egi~bin/tran\_web\_cgi\_ejje?atw\_u=http%3A%2F%2Fwww4.ipdli... 2010/05/06

JP.4150220.B [DETAILED DESCRIPTION]

\* is mentioned. The principal chain skeleton of a polyoxyalkylene series polymer may consist of one kind of repeating unit, and may consist of two or more kinds of repeating units. When used especially for sealant etc., it is desirable from that what comprises the polymer which uses a polyoxypropylene system polymer as the main ingredients is amorphous, or the point which is hypoviscosity comparatively.

complex establyst life a complex produced by making an erganealuminium compound and posthyrin which are shown in LPL 5196254. As executed the A-27250B, U.P.S9-1539B, a. U.S. Pat No. 3273B457 items, a U.S. Pat No. 3273B457 items, a U.S. Pat No. 3273B458 items, a U.S. Pat No. 3473B458 items, a U.S. Pat No. 3473 As a synthetic method of a polyoxyalkylene series polymer. For example, the polymerizing method by an alkali catalyst like KOH. the polymerizing method by a transition metal compound-porphyrin shown in a U.S. Pat. No. 3427335 item etc., \*\*\*\*\*\*\*\*\*\*\*\* such as the polymerizing method using a Pat No. 3427334 item, The polymerizing method by a composite metal cyanide complex catalyst polymerizing method using a catalyst which consists of a phosphazene compound illustrated by catalyst which consists of a polyphosphazene salt illustrated by JP,H10-273512.A, and the

ingredients, such as a urethane bond ingredient, may be included in the range which does not spoil an in a principal chain skeleton of the above-mentioned polyoxyalkylene series polymer, other

effect of this invention greatly.

JP,H11-060722,A, are not limited in particular.

compounds, such as aliphatic saries system polyiscoyanates, such as hexametrylane di-isocyanate, and polyol which has a repeating unit of the above-mentioned general formula (14) can be mentioned. tolylene disocyanata. Aromatic system polyisocyanates, such as diphenylmethana disocyanate and cylylane discoyanate; Isophorone discoyanate, What is obtained from a reaction of polyisocyanate It is not limited especially as the above-mentioned urethane bond ingredient, but For example,

JP.61-197631A, JP.61-215622A, JP.61-215623A, JP.61-218632A, JP.H3-72527A, JP.H3-47825.A. JP,57-164123.A, JP,3-2450,B. a U.S. Pat. No. 3622557 item, What is proposed by each gazette, such A manufacturing method of a polyoxyalkylene series polymer which has a reactive silicon group, JP,45–36319,B, JP,46–12154,B, JP,50–156599,A, JP,54–6096,A, JP,55–13767,A, JP,55–13468,A, as a U.S. Pat. No. 4345053 frem, a U.S. Pat. No. 4366307 frem, and a U.S. Pat. No. 4960844 frem, Although it is indicated by each gazette of JP,H8-231707,A and 6.000 or more number average motecular weights and Mw/Mn (ratio of weight average motecular weight and a number average motecular weight) can use conveniently a polyoxyalkylene series polymer with narrow motecular A polyoxyalkylene series polymer which has the above-mentioned reactiva silicon group may be used alone, and may be used tokether two or more sorts.

weight distribution in the 1.6 or less amount of Polymer Division, It is not limited to in particular

A polymer which makes a skeleton of a saturated hydrocarbon system polymer which has a reactive

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JP,4150220,B [DETAILED DESCRIPTION]

such as ethylene, propylene, 1-butene, and isobutylane, is polymarized as the main ingredients, and ] silicon group used for this invention, (1). [ whether an olefinic compound of the carbon numbers 1-6 After making diene sarias, such as butadiene and isoprene, homopolymerize or carrying out

polymer tend to introduce a functional group into an end, and tend to control a molacular weight and hydrogenating, but. Since an isobutylene system polymer and a hydrogenation polybutadiene system copolymenization to the above-mentioned olefinic compound, can obtain by a method of can increase the number of end functional groups, they are preferred.

ess % of the weight still more preferably 50 or less % of the weight. In an isobutylene system polymer. weight, since characteristic physical properties, such as high weatherability, high heat resistance, low moisture permeability, etc. resulting from an isabutylene skeleton, are not fully revealed, it is not All the monomeric units may be formed from an isobutylene unit, and an isobutylene system polymer, it is [ in an isobutylene system polymer ] desirable, and a monomeric unit which has isobutylene and copolymeric may be especially contained in 10 or less % of the weight of the range preferably 30 or when content of a monomeric unit which has isobutylene and copolymeric exceeds 50 % of the

λs such a monomer component, an olefin of the carbon numbers 4-12, vinyl ether, an aromatic vinyl xample 1-butene, 2-butene, A 2-methyl-1-butene, a 3-methyl-1-butene, a pentene, 4-methyl-1pentene, A hexene, a vinyloyclohexene, the methyl vinyl ethar, athyl vinyl ethar, laobutylvinyl ether, compound, vinyIsitane, and aryIsitane are raised, for example. As such a copolymer component, for tyrens, alpha-methylstyrene, dimethylstyrene, Monochlorostyrene, dichlorostyrene, beta-pinene,

/inyldimethylmethoxysilane, Vinyl trimethylsilane, divinyl dichlorosilane, divinyl dimethoxysilane, Divinyl fimethylsilane, the 1,3-divinyl- 1, 1, and 3, 3-tetramethyl disloxane, TORIBI nil methylsilane, a cetravinyl silane, allytrichlorosilane. Allyl methyldi ohlorosilicane, allyldimethylchlorosilicane, ndene, vinyl triohlorosilana, Vinyl methyldi ohlorosilicane, vinyldimethylchlorosilicane,

allyidimethyl methoxysilane, aliyi trimethylsilane, diaryl dichlorosilane, diaryl dimethoxysilane, diaryl

limethylsilane, gamma-methaoryloyl oxypropyl trimethoxysilane, gamma-methaoryloyl oxypropyl nethyl dimethoxysilane etc. are raised.

aryisilane are used, a basis which silicon content increases and can act as a silane coupling agent will As a monomeric unit which has isobutylene and copolymeric among the above. If virylstlane and ncrease, and the adhesive property of a constituent obtained will improve.

ngredients like a case of the above-mentioned isobutylene system polymar in a hydrogenation Other monomeric units may be made to contain besides a monomeric unit used as the main

invention is attained may be made to contain in 1 or less % of the weight of the range preferably compounds, such as butadiene and isoprene, remains in the range in which the purpose of this to a saturated hydrocarbon system polymer which has a reactive silicon group used for this invention. A little monomeric units in which an after-polymerization double bond lika polyene polybutadiene system polymer or other saturated hydrocarbon system polymers.

A saturated hydrocarbon system polymer which has these reactive silicon groups can be independent, or can be used together two or more sorts.

especially 5 or less % of the weight still more preferably 10 or less % of the weight.

A process of a saturated hydrocarbon system polymer which has a reactive silicon group next is

An isobutylene system polymer which has a reactive silicon group in molecular chain terminals among sobutylene system polymers which have a reactive siltoon group, an end organic-functions type

nanufacture preferably using a whole and organio-functions typa isobutylane system polymer. As a combining and [ which is called iniphor ] and a chain transfer agent) called iniphor method — it can obtained by the polymerizing method (cationio polymerization method using a specific compound

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process of a saturated hydrocarbon system polymer which has a reactive silicon group, For example, general formula (15) after obtaining polyisobutylene which has an unsaturation group at the end by combination obtained by a polymerization reaction, the reaction of an end of a polymer and ally dehydrohalogenation reaction of an end of a polymer which has third class carbon-chlorine trimethylsilane which have third class carbon-chlorine combination, etc. :

this compound is a compound which the hydrogen atom combined with the basis expressed with a (R1, R2, X, m, a, and b are the same as the above among a formula.) --- the hydrosilane compound general formula (1), expressed -- desirable -- general formula (16).

(hydrosilylation reaction) to which the hydrosilane compound expressed is made to add using a  $\mathbb{R}^2$ , X, and c are the same as the above among a formula.) — it can obtain by the reaction

nectoxystane, The acyloxy states like a phenyldasectoxystane; athough the RTDOKISM mate stitnes the bids between the confidentely RCTOKISM mathority islane and bids opolonoxy RCTOKISM mathority islane and bids opolonoxy RCTOKISM mathority islane are ristaned, it is not limited to these. Among these halogenation Stimes and alloxystains are preferred. As a hydrosilane compound, for example Trichlorosilane, methyldi ohlorosilicane, Halogenation Silang methyldiathoxyailane, methyl dimethoxysilane, The alkoxysilane like phenyl dimethoxysilane, Methyldi like dimethylohlorosilicane and phenyl dichloroailane, Trimethoxysilane, Triethoxysilane, platinum catalyst.

Such a manufacturing method is indicated in each gazette of JP,4-69659,B. JP,7-108928,B. JP,63-254149,A. JP,64-22904,A. and the patent No. 2538445. for example. aspecially in respect of the ease of acquisition, etc.

An isobutylene system polymer which has a reactive silicon group in a chain side chain is

manufactured by adding and carrying out copolymerization of the vinylsilane and arylsilane which have a reactive silicon group into a monomer containing isobutylene.

group in an and and a chain side chain is manufactured by introducing a reactive silicon group into an nonomer which is tha main ingredients, an isobutylene system polymer which has a reactive silicon has a reactive silloon group in molecular chain terminals. After carrying out copolymerization of the In the case of a polymerization reaction which manufactures an isobutylene system polymer which vinylsilane and arylsilane etc. which have a reactive silicon group in addition to an isobutylene

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As the vinylailane which has a reactive silloon group, and arylailane, For example, vinyl trichlorosilane, rinyl methyldi ahlorosilicane, vinyldimethylchlorosilicane, Vinyldimathylmethoxysilane, divinyl lichlorosilane, divinyl dimethoxyallana, Allyltrichlorosilane, allyl methyldi chloroallicane,

ally idimethylchlorosilicana, Allyldimethyl methoxysilane, diaryl dichlorosilana, diaryl dimethoxysilane, gamma-methaoryloyl oxypropyl trimethoxysilane, gamma-methaoryloyl oxypropyl methyl

limethoxysilane, etc. are raised.

group. A hydrogenation polybutadiene polymerization object which has a reactive silicon group can be acquired by the hydrosilylation reaction of a hydrogenation polybutadiene polymerization object which has an olefin group. General formula (17) after a hydrogenation polybutadiene system polymer which has an end olefin group uses a hydroxyl group of an end hydroxy hydrogenation polybutadiene system n this invention, a hydrogenation polybutadione polymerization object which has a reactive silicon group can be mentioned as a saturated hydrocarbon system polymer which has a reactive silicon polymer as oxy metal groups, such as -ONs and -O.K., first, for example:

Halogen atoms, auch as a chlorine atom, a bromine atom, and iodine atoms, and R4 are among [type, and Y is "R"-, -R"-000-, or -R"-00. - (R" is a divalent hydrocarbon group of the carbon numbers -20, and) an alkylene group, a cyclo alkylene group, an allylene group, and an aralkylene group --- it is desirable — by a divalent organic group shown. – It can obtain by making an organic halogenated compound shown by especially a divalent basis chosen from  $\mathrm{CH}_2^-$  and  $-\mathrm{R}^-\mathrm{C}_6\mathrm{H}_4^+\mathrm{CH}_2^-$  (R $^-$  is a nydrocarbon group of the carbon numbers 1-10) being preferred] react.

As a method of using terminal hydroxyl groups of an end hydroxy hydrogenation polybutadiene

system polymer as a oxy metal group. A method of making it react to alkaline-water oxides, such as metal alkoxide.NaOH like metal hydride,NaOH3 like Na and KOH, etc. is

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organic haloganated compound which contains two or more halogen in one molecule, and is shown by a general formula (17) after that, A hydrogenation polybutediene system polymer which is the amount weight as an end hydroxy hydrogenation polybutadiene system polymer used as a starting material is Although an end olefin hydrogenation polybutadiene system polymer with the almost same molecular react to obtain a polymer of the amount of Polymer Division more, at the time, such as a methylene obtained in said method, Before making an organic halogenated compound of a general formula (17) halogenated compound which can increase a molecular weight if it is made to react to a multivalent phoride, bis(chloromethyl)benzene, and bis(chloromethyl)ether. If it is made to react to an organic of Polymer Division more, and has an olefin group at the end can be obtained.

As an example of an organic halogenated compound shown by said general formula (17), For example, (bromonestryd) berszene, Although allyl (chlorosestryd) ether, allyl(chloromestroxy) berszene, 1-butsnyl (bromonestryd) ether. I herzeny(chloromestroxy) berszene, allyloxy (chloromestryd) berszene, etc. are relasol, it is net limited to them. Among these, an allyl obloride is chesp, and since it moreover reacts. an allyl chloride, an allyl star's picture, vinyl chloromethyl) benzene, Allyl (chloromethyl) benzene, allyl

introduction of a reactive silicon group to said end olefin hydrogenation polybutadiene system

polymer may be manufactured by carrying out an addition reaction using a platinum system catalyst in a hydrosilane compound like a case of an isobutylene system polymer which has a reactive silicon group in molecular chain terminals.

When a saturated hydrocarbon system polymer which has a resctiva silicon group as mentioned sbove does not contain substantially an unsaturated bond which is not an aromatic ring in a molecule, Compared with a sealing agent etc. which consist of a conventional rubber ayatem polymer like an ttp://www4.ipdl.inpit.go.jp/cgi~bin/tran\_wcb\_cgi\_ejje?atw\_u=http%3A%2F%2F%2Fwww4.ipdli... 2010/05/06

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weatherability becomes good remarkably. Since this polymer is a hydrocarbon systam polymer, its weter resisting property is good, and a low hardanad material of humidity permeability is obtained. organic system polymer or an oxyalkylene system polymer which has an unsaturated bond,

together two or more sorts. Specifically, a polyoxyalkylane series polymer which has a reactive silicon polymer which has a reactive silicon group, and an organic polymer which blends two or more sorts An organio polymer which has these reactive silicon groups may be used alone, and may be used group, a saturated hydrocarbon system polymer which has a reactive silicon group, a vinyf-base chosen from a group, \*\* and others, can also be used.

A manufacturing method of an organic polymer which blends a polyooyalitylane series polymer which as a reactive allicon group, and a vinyl-base polymer which has a reactive allicon group. Although indicated by US9-122614, UP33-173642, UPHE-1728314, UPHI-1167934, etc., it is not limited to in particular these. 0083

A desirable example has a reactive sillcon group and a chain is a following general formula substantially (18):

Formula 9]

(a hydrogen atom or a methyl group, and R<sup>7</sup> show the alkyl group of the carbon numbers 1-8 among a The acrylic ester monomer unit which has an alkyl group of the carbon numbers 1-8 expressed with formula, as for R<sup>6</sup>) (meta), and following general formula (19):

Formula 10]

(— inside of formula, and  ${\sf R}^6$  — the above — the same —  ${\sf R}^8$  shows a with a carbon numbers of ten or more alkyl group —) — to the copolymer which consists of an acrylic ester monomer unit which blending and manufacturing the polyoxyalkylene series polymer which has a reactive silicon group. has a with a carbon numbers of ten or more expressed alkyl group (meta-). It is the method of Acrylic acid (meta) expresses acrylic acid and/or methacrylic acid with the above-mentioned

expressive form.

propyl group, n-butyl group, t-butyl group, a 2-ethylhexyl group, etc. — desirable — 1-4 — an alkyl group of 1-2 ia raised still more preferably. An alkyl group of R<sup>7</sup> may be independent and may be as  ${\rm R}^7$  of said general formula (18) — the carbon numbers 1–8 of a methyl group, an ethyl group, a mixed two or more sorts. as  $R^8$  of said general formula (19) — ten or more carbon numbara of a lauryl group, a tridecyl group, a

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nixad two or more sorts.

Although a chain of this vinyl system copolymer consists of a monomaric unit of a formula (18) and a

formula (19) substantially, a "real target" here means that the sum total of a monomeric unit of a formula (18) which exists in this copolymer, and a formula (18) surpasses 50 % of the weight. The sum octal of a monomeric unit of a formula (18) and a formula (19) is 70 % of the weight or more From a point of compatibility with a polyoxyalitylene series polymer, as for an abundance ratio of a monomeric unit of a formula (18), and a monomeric unit of a formula (19), 95:5–40:80 are preferred at a weight ratio, and 90:10-60:40 are still more preferred.

preferably.

As monomeric units other than a formula (18) which may be contained in this copolymer, and a formula (19), For example, carboxylle acid groups, such as acrylic acid and methacrylic acid, acrylamide, Amide groups, such as methacrylamide, N-methylolacrylamide, and N-

mathylatyrene, alkyl vinyl ether, VOM/PVC, vinyl acetate, vinyl propionate, ethylane, atc. in addition Diethylamino ethyl acrylata, diethylamino ethyl methacrylate, A monomer containing amino groups, such as aminoethyl vinyl ether, a monomerlo unit which originatea in acrylonitrile, styrene, alphamethylolmethacrylamide, Epoxy groups, such as glycidyl acrylate and glycidyl methacrylate, to this is raised.

as a reactive silicon group, and a viryl-base polymer which has a reactive silicon group is indicated Although an organic polymer which blends a saturated hydrocarbon system system polymer which by JP,H1-168764,A, JP,2000-186176,A, etc., it is not limited to in particular these.

organic polymer which has a reactive silicon group as a manufacturing method of an organic polymer 4 method of polymerizing an acrylic ester (meta) system monomer elsewhere under existence of an which blends a vinyl-base polymer which has a reactive siltoon group can be used. Although this nanufacturing method is concretely indicated by each gazette, such as JP,59-78223,A, JP,59-68014,A, JP,60-228516,A, and JP,60-228517,A, it is not limited to these

nanganese, carboxyllo sold nickel, carboxylic sold cobalt, and a carboxylic sold zirconium, it functions as what is called a allanol condanaation catalyst in which a alloxane bond may be made to form from One or more sorts of carboxyllc acid metal salt chosen from carboxyllc acid barium, carboxylic acid Carboxylio acid vanadium, carboxylic acid iron, oarboxylic acid titanium, carboxylle acid potassium, a hydroxyl group combined with a silicon atom contained in an organio polymer which is the (A) Carboxylic acid calcium used as a (B) ingradient in a hardenability constituent of this invention. ngredient of this invention, or a hydrolytic basis.

atalyst is high, carboxylic acid calcium, carboxylic acid vanadium, carboxylic acid iron, carboxylic acid in said carboxylic acid metal salt, carboxylic acid calcium, carboxylic acid vanadium, Carboxylic acid manganese, and a carboxylic acid zirconium, it is more desirable from a point that the activity of a ron, carboxylic acid titanium, carboxylic acid potassium, carboxylic acid barium, carboxylic acid stanium, and a carboxylic soid zirconium are still more preferred, and carboxylic soid iron and

octassium, carboxylic acid barium, carboxylic acid manganese, carboxylic acid nickel, carboxylic acid ardenability constituant obtained, and a point that the heat resistance of a hardened material and sobalt, and a carboxylic sold zirconium, It is more desirable from a point with little coloring of a Sarboxylic acid calcium, carboxylic acid vanadium, carboxylic acid titanium, Carboxylic acid sarboxylic acid titanium are especially the most proferred

weathersbility which are obtained are high, and carboxylic soid calcium, carboxylic soid titanium,

carboxyllo aoid potassium, carboxyllo acid barium, and a carboxylic acid ziroonium are still more

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This (B) ingredient uses as the main ingradients carboxylic acid metal aak expressed with general

ormula (2) - (12), respectively. Ca(OCOR) 2 (2) V(OCOR) 3 (3)

Fe(OCOR) 2 (4) Fe(OCOR) 3 (5) T(OCOR) 4 (6)

nickel(OCOR) 2 (10) 3a(OCOR) 2 (8) Mn(OCOR), (9) K(OCOR) (7)

Zr (O) (OCOR) , (12) Co(OCOR), (11)

The inside R of a formula is substitution or an unaubstituted hydrocarbon group, and may include a As carboxylic acid, a carboxylic acid group content compound of a hydrocarbon ayatem of 2-40 is carboxylic acid group content compound of a hydrocarbon system of the carbon numbers 2-20 used suitably, and a carbon number including carbonyl carbons may be especially used for a parbon carbon double bond.)

Enanthic acid, caprylio acid, 2-cthylhexanoic acid, polargonic acid, capric acid, Undecanoic acid, lauric 0.12-octadecadienoic acid, HIRAGO acid, alpha-eleostearic acid, beta-eleostearic acid, punicic acid. tetraenoic acid, MOROKUCHI acid, steer RIDON acid, Arachidonic acid, 8 12,16,19-docosatetraenoic ocid, Tsuzuio acid, FIZETERIN scid, myristoleio scid. 2-hexadecenoic acid, 6-hexadecenoic acid. 7hexadecenoic soid, palmitoloic soid, a petrosolinic soid, Oleic soid, elsidic soid, ASUKUREPIN soid, veccenic soid, gadoleic soid, Gondo Inn soid, a cetoleic soid, eruoic soid, brassidic soid, selacholeic When it illustrates concretcly, acetic scid, propionic scid, butanoic acid, a valeric acid, caproic acid. nonadecanoic acid, arachin acid, Behenic acid, lignoceric acid, cerinic acid, montanic acid, melissic acid, Straight chain saturated fatty acid groups, such as RAKUSERU acid; Undecylenic acid, Linder acid, Monoene unsaturated fatty acid, such as KISHIMEN scid and RUMEKUEN acid; Linolic acid, linolenio acid, 8,11,14-eicosatrienoic acid, a 7,10,13-docosatrienoio acid, 4,8,11,14-hexadeca acid, tridocylacid, myristic acid, pentadecyl acid, Pulmitic acid, heptadecylacid, stearic acid, aultably from a point of availability here.

tuberculosteario sold, a pivalio sold, and neo decanoic sold; A tarriro sold, Fatty sold with triple bonda, such as steer roll sold, a orepenynic sold, KISHIMENIN sold, and 7-hoxa orepa-de-Chine sold; hydroxyhexadecanolc acid, YARAPI Nonan acid, uni-PERIN acid, AMBURETTORU acid, ARYURITTO acid, 4.8,12,15,18-eicosapentaenolc acid, Polyane unasturated fatty acid, such as clupanodonic acid Naphthenic acid, A malvalio acid, sterculio acid, HIDONO carbyne acid, chaulmoogric acid, Alicyclic Oxygenated fatty acid, such as 9,10-dihydroxyootadecanoic acid, recinoleic acid, cam ROREN acid, licanic acid, ferron acid, and cerebronic acid, dicarboxylic acid, such as succinic acid, glutaric acid, parvone acids, such as gorlic acid; Sabinic acid, 2-hydroxytetradecanoic acid, IPURORU acid, 2acid, 2-hydroxyoctadecanoic acid, 12-hydroxyoctadecanoic acid, 18-hydroxyoctadecanoic acid, narring acid, and docesahexaencic acid; Iso acid, Branch fatty acid, such as antaiso acid, idipic acid, pimelic acid, SUPERIN acid, azelaic acid, and sebacic acid, is mentioned.

that it is 65 \*\* or leas, it is more preferred that it is -50-50 \*\*, and it is preferred that it is especially when the melting point of said carboxylic acid is high (crystallinity is high), the melting point becomes high in a similar manner, and it is hard to doal with carboxylic acid metal salt which has the acid radioal (workability — bad). Therefore, as for the melting point of said carboxylic acid, it is preferred

when a carbon number of said carboxylic acid is large (a molecular weight is large), it becomes

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oil etate or viscolar and section that which has the and cincile bronnes a sheely which has a high oild etate or viscolar and section that are set of section that the section that are set of section that are set of section that are set of section to see that the section that are set of section to set of set of section that are set of set of section that are yet in consolar set, which has the sed restain. It is noticing mostly an improficient velor viscolar set of which has the sed restain. It is noticing mostly an improficient velor viscolar set of which has the set of restain. It is noticing mostly an improficient velor viscolar set of his period set of restain of section that we have a set of the set of

(i) (i) (ii) (ii) (iii) (iiii) (iii) (iiii) (iii) (iii

carboxyle soid (Z-athytheranoie soid etc.) whose carbon atoms in which said carboxylic acid adjoins a carbonylic group are the thick cliss carbon wall achaboylic sold too desand outably which is authorized authorized action to see a carbonylic action to the private action is a carbonylic action to the carbonylic action is considered, carboxyle soid whose carbon atom which edgins a carbonylic group is qualarmary carbon is preferred.

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retrevelence), at an ementioned.
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From a Verwegorit of coloring to 2-ethylinearnole and stantam (tetranslerions). 2-ethylinearnole and disconding disconding disconding services and services are services and services and services are services and services and services and services and services are services and services are services and services and services and services are services and s

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irconium (tetravalence) are mora preferred.

Solut contravable and must all stitutures are enabledus and guous processes communication of its settler and neighn hydrodist exect, and makes acution of head ones. Solution of metal selt prepared apart from this in headfors, as elementation method which existen meltiles loss, by cathody orising group contrart commonwed rests are settler and message inforced, as notified set, but which are devolved to an elementation expend which is expected to the which are devolved to an cholodist and exchanged less give group expected, and only a make to resert to the which as a devolved and extraordistic less give any communities. The set of the set of the set of any other set of the method to which a wardle set is made to resert at an elevated semperature, and direct method to which a sense of given content compound and metal provider are made to resert.] an anitydous organic oxident are taken. As for each carboxylic soid metal sail, it is preferred to ditute with dituting solvents, such as a minoral sprift, tolutera, linchione givolo, a depthytine glyod, a parelitin oil, and droby) phythalite, and to be used with a greatle of a solution whose metal content is about 1 to 40 % of the weight.

(ii) About OLDE's weight sections are preferred at metallic informer concentration in the (II) Anceding to (A) impression (1) weight section as a mount of impression transf and also about 0.0.11 weight sections are preferred (II) Since a cure rato may become alow and a hardening resection will section for the other interaction of the pression and the properties of the preferred from a point of distribution. On the other hand, port it is becomes after too much and is not preferred from a point of distribution section that a pool instruction market as will be more prevented in the preferred from a point of the time of handeling site, and is lend to be obtained it lendings of the IIB linguidient cooper that the forming boat in the time of handeling site, and is lend to be obtained it lendings of the IIB linguidient cooperties.

[0108]

The eferement/oned carbonyle and endurum, enhanged acid uninsatur, enchangle acid introthorylor lead strainmen, carbonylor and peatssium, carbonylo acid benium, carbonyle acid and manganesa, carbonylo acid index), carbonylor acid obells, and a carbonylo acid carbonylum. Besides manganesa, carbonylor acid index), carbonylor acid obells, and a carbonylor acid stroominm. Besides mangate althoris, the based complings town or more acid, and also can so register with entropolic acid tim salt, entropylo acid (and salt, carbonylor acid bismuth salt, carbonylor acid carbon, and ex-

(dimethyl aminomethyl) phenol, Although morpholine, N-methylmorpholine, 2-ethyl-4-methylimidazole, example, Specifically Methylamine, ethylamine, propylamine, isopropylamine, A butylamine, amyl amine, On the other hand, only with carboxylic acid metal salt of the (B) ingredient, activity is low, and when moderate hardenability is not acquired, various amine compounds which are the (G) ingredients as a hoxylamine, octylamine, 2-ethylhexylamine, Nonyl amine, decyl amine, lauryl amine, pentadecyl amine, co-catalyst can be added. As various amine compounds, although indicated to JP,H5-287187,A, for dodecamethylonediamine, dimethylethylonediamine, Triethylenediamine, guanidine, diphenylguanidine aromatic-amine; Lauryl aniline, stearylaniline, a triphenylamine, N.N-dimethyleniline, dimethylbenzy senzylamine, Diethylamino propylamine, xylylene diamine, ethylenediamine, Hexamethylenediamine, Dimethylamine, Diethylamine, dipropyl amine, disopropylamine, dibutył emine, Diamylemine, dioetyl N.N.N., and N"-tetramethyl 1,3-butanediamine, N.N.N. N"-tetramethyl ethylene diamine, 2,4.6-tris butyistearylemine; Tricthylamine, Aliphatio seriee tertiary amines, such ea triamylamine, trihexyl emine, and trioctylamine; Triaryl amine, Aliphatio series unseturetion amines, such as oleylamine; smine, di(2-ethylhexyl) amine, Didecyl emine, dilauryl amine, JISECHIRU amine, distearyl amine, , and 8-diazabioyclo (5, 4. 0) undecene 7 (DBU) etc. are mentioned, it is not limited to these. Aliphatic series primary amines, such as Sept Iles amine, stearylamina, and cyclohexylamine, dimethylamino ethanol, diethylenetriamine. Tricthylenetetramine, tetraethylenepentamine, aniline, etc. reech, As other amines, monoethanolamine, diethanolamine, Tricthanolamine, Aliphatic series secondary aminas, such as methylstearylamine, ethylstearylamine, and

In this invention, an amino group content allone coupling agent can also be used as a (C) ingredient. Said amino group centert allone coupling agent is a constant with other basis (hencherth in hydrolydo basis of the content and a said on the content of the hydrolydo basis invented is only good and a said on stem which is hydrolydo basis whore the content of the hydrolydo basis anothed. As an exercise a shift which is a hydrolydo basis among these sequessed with a general formula (1). Addrough is absis already instructed as a basis enough these sequessed with a general formula (1). Addrough is absis already mattered as a formula of a hydrolydo basis, and an experience of the content of productions are not content or more number of a hydrolydo basis. http://www4.ipdlinpit.go.jp/ogi-bin/tran\_wob\_ogi\_ejje?atw\_u=http%3A%2F%2Fwww4.ipdli... 2010/05/06

## three or more pieces are preferred

4s an axample of an amino group content silane ooupling agent, gamma-aminopropyl trimethoxysilane, aminopropyl trimethoxysilane, gamma-(2-aminoethyl) aminopropyl methyl dimethoxysilane, gamma-(2rinylbenzył gamma-aminopropył triethoxysilane, etc. can be mentioned. Amino modifying silył połymer which is the denatured derivative, stanting amino polymer, an unsaturation aminosilane complex, a phenylamino long chain alkyl silano, amino silantzing silicone, etc. can use these. The above nentioned amino group content silene coupling agent may be used only by one kind, and may carry gamna-aminopropyl triethoxysilane, gamna-aminopropyl triisopropoxy silane, gamna-aminopropyl aminoethyl) aminopropyl triethoxysilane, gamma-(2-aminoethyl) aminopropyl methyldiethoxysilane, gamma-(2-aminoethyl) aminopropyl triisopropoxy silane, gamma-ureido propyltrimethoxysilane, Nphenyl-gamma-aminopropyl trimethoxysilane, N-benzyl-gamma-aminopropyl trimethoxysilane, Nmathyl dimethoxyailane, gamma-aminopropyl methyldiothoxyellana, gamma-(2-aminoethyl) out two or more kind mixing use. As these (C) ingredients, since co-catalyst ability changes greatly with structure of the (C) ingredient system polymer as a (A) ingrediant, aliphatic series secondary aminas, such as comparatively longtself, compatibility with the (A) ingredient, etc., it is preferred to choose a compound which was suitable according to a kind of (A) ingredient to be used. For example, when using an isobutylene chain aliphatic saries accondary amines, such as dioctyl amine and distearyl amine, and

weight sections are preferred to organic polymer 100 weight section of the (A) ingredient, and also its 5.1 - 5 weight section is more preferred. A cure rate may become it slow that loadings of an amine advance. On the other hand, if loadings of an amine compound exceed 20 weight sections, pot life dicyclohexylamine, are preferred from a point that co-catalyst ability is high. (0113) As for badings of an amine compound which is the aforementioned (Q) ingradient, about 0.01-20 compound are less than 0.01 weight sections, and a hardening reaction becomes fully difficult to may become short too much and is not preferred from a point of workability.

Silane coupling agents other than an amino group content silane coupling agent can also be used for a constituent of this invention.

As functional groups other than an amino group, a sulfhydryl group, an epoxy group, a carboxyl group, a vinyl group, an isocyanate group, isocyanurate, halogen, etc. can be illustrated.

phloropropyltrimetoxysilane, ]; — isocyanurate silanes [, such as tris (trimethoxysilyl) isocyanurate, ]. amma-mercapto propyltrimethoxyailane, gamma-mercaptopropyl triethoxyailane, Sulfhydryl group propyltriethoxysilane, gamma-glycidoxy propyl methyldimethoxysilane, bata-(3, 4-epoxycyclohexy0 oxypropyl methyl dimethoxysilane, vinyl type unsaturation group content Silang [, such as gamma-As an example of silane coupling agents other than an amino group content silane coupling agent, ethyliriettooyallare, beits-carelooyethyl irietbooyallare, beits-carbooyethyl pienublaig2-metooyethooyslians, Carbooyallares, such as N-beits-carbooymethyl annioethyl genome-mentopropyl threstbooyallare, Vnythrestooyallare, vinythietbooyallare, gamms-metharohothy AKURO yloxy propylmethyl triethoxysilane. J. — containing halogen Silang [, such as gammacontent Silang, such as gamma-mercaptpropylmethyl dimethoxysilane and gamma-mercapto propylmethyl diethoxysilane; Gamma-glycidoxypropyltrimetoxysilane, gamma-glycidoxy sthyltrimethoxysilane, Epoxy group content Silang, such as beta-(3,4-epoxycyclohexyl)

polyester, etc. which are the derivatives which denaturalized these can be used as a silane coupling

socyanate propylmethyl dimethoxysilane, can be mentioned. A block isocyanate silane, silanizing socyanatepropyl triethoxysilane, gamma-isocyanate propylmetnyl diethoxysilane, and gamma-

socyanate group content Silang, such as gamma-isocyanate propyltrimethoxysilane, gamma-

The amount of [ in case used of using silane coupling agents other than an amino group content silane coupling agent ] has 0.01 - 20 preferrad weight section to (A) ingredient 100 weight section.

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# and also its 0.1 - 5 weight section is more preferred.

titanium oxide, talc, etc. are more preferred than points, such as a reinforoing effect, the increase-inquantity effect, and an ease of acquisition. These fillers may be used indopendently and may be used together two or more sorts. The amount of £ in case used of using a filler ] has 10 – 1000 preferred parbonate, clay, talo, titanium oxide, aluminium hydroxide, magnesium carbonate, aluminum impalpabl Various fillers can be usad for a hardenability constituent of this invention if naeded. As an example nica, walnut shell powdar, chaff powdar, Graphite, diatomite, clay, fume silica, sadimentation nature bowder, the Flint powder, the end of zinc dust, etc. are raised. Among these fillers, sedimentation of said filler, for example Wood flour, PARUBU, a ootton ohip, Asbestos, glass fiber, carbon fiber, nature silica, fume silica, crystalline silica, fused silica, dolomite, carbon black, calcium carbonato, weight section to (A) ingredient 100 weight section, and its 50 - 300 weight section is still more silica, Crystallina silica, fused silica, dolomite, a silicio acid anhydride, carbon black, calcium

phthalate; Dioctyl adipate, \*\*\*\* aliphatic dibasic acid ester, such as succinic acid isodecyl and dioctyl sebacate; Diethylene glycol dibenzoate, \*\*\* glycol ester, such as pentaerythritol ester; Butyl claate, bulking agent, it is more effective. As an example of a plasticizer, dioctyl phthalate, dibutyl phthalate, phosphoric ester, such as trioctyl phosphate and phosphoric sold octyldiphenyl; Epoxidized soybaan oit, \*\*\*\*\* epoxy plasticizers, such as epoxidation linseed oil and epoxy stearic acid bonzyl; Polyether, such as a polyester plasticizer; polypropylene glycol which is polyester of dibasic acid and difydric Dolybutadiene, Butadiene Acrylonitrile, polychloroprene, polyisoprene, polybutene, hydrogenation \*\*\*\* aliphatic series ester species, such as methyl acetyl ricinolate; Tricreayl phosphate, \*\*\*\* enlarged or a lot of bulking agents can be mixed if a plasticizer is used, using it together with a In a hardenability constituent of this invention, since elongation of a hardened material can be polybutadiene, hydrogenation polyisoprene, Hydrocarbon system oligomer, such as process oil, \*\*\* phthalic estar, such as butylbenzyl phthalate, di-isodecyl phthalate, and JIISO undacyl alcohol, and its derivative; [ Polly alpha-methylstyrene, ] Polystyrene, such as polystyrene.

These plasticizers may be used alone and may be used together two or more sorts. A desirable result will be obtained if the amount of plasticizers is used in the range of one to 200 weight section to chlorinated paraffins are illustrated.

An epoxy resin can be used togother in a hardenability constituent of this invention. In this oase, an cpoxy reain and reactive silicon group containing organic polymer can be reformed.

reactive-silicon-group-containing-organic-polymer 100 weight section.

As an epoxy resin, can use a publicly known thing widely convantionally, and For example, a bisphenol such as tetrahydrophtal acid diglycidyl ester and diglycidyl hexahydrophthalate, m-aminophenol series głycidyl ether of tetrabromobisphenol A, Novolak type epoxy reain, a hydrogenation bisphenol A type epoxy resin, A głycidyl ether type epoxy resin of a bisphenol A propylene oxide addition, Diglycidyl pspoxy resin, a diaminodiphenylmethane system epoxy resin, Urethane modified epoxy resin, various alcohol, such as polyalkylene glycol diglycidyl ether and glycerin, a hydantoin type epoxy resin, and A type epoxy resin, Fire retardancy type epoxy resins, such as bisphenol F type epoxy resin and oxybenzoic acid, phthalic acid diglycidyl ester, Phthalic acid diglycidyl ester system epoxy resins. socyanurate, An epoxidation thing of unsaturation polymers, such as glycidyl ether of polyhydric syclosliphatic-epoxy-resin, N, and N-diglycidyl aniline, N,N-diglycidyl o-toluidine, triglycidyl petroleum resin, etc. can be mentioned. It is desirable from a point of a thing containing at least two epoxy groups having high reactivity when hardening and a hardened material tending to form the three-dimensional network structure into a piaphenol F type cpoxy resin, novolak type epoxy resin, and a phthalic soid diglycidyl ester system molecule, also in these cpoxy resins. As a desirable epoxy resin, a bisphenol A type epoxy resin, spoxy resin can be illustrated from availability and an adheaive point. nttp://www4.ipdlinpit.go.jp/ogi-bin/tran\_wab\_ogi\_ejje?atw\_u=http%3A%2F%2Fwww4.ipdli.. 2010/05/06

used widely conventionally, For example, tristhylenetetramine, tetraethylenepentamine, diethylamino As a hardening agent of an epoxy resin, a publicly known hardening agent for epoxy resins can be propylamine, N-aminoethyl piperazine, m-xylylene diamine, m-phenylanediamina.

sarboxylic acid, such as tetrahydro phthalic anhydride and methylene tetrahydro phthalic anhydride, a DODESHINIRU succinic anhydride, pyromellitic dianhydride, and anhydrous KUROREN acid, alcohols, Diaminodiphenylmethane, diaminodiphenyl sulfone, isophoronediamine, Amines, such as 2,4,6-tris (dimethyl aminomethyl) phenol. Tertiary smine salts, polyamide resin, ketimines, and aldimine. maidious hardening agents, such as enamines, imidazole derivatives, and dicyandiamides. Boron vifluoride complex compounds, phthalic anhydride, hexahydro phthalic anhydride, Anhydrous

preferred to use it in the range of one to 100 weight section and also ten to 50 weight section, and it An epoxy resin receives reactive-silicon-group-containing-organic-polymer 100 weight section, it is is preferred to blend a hardening agent of an epoxy resin per epoxy resin 100 weight section in the

phenols, and carboxylic acid can be mentioned.

pardenability constituent of this invention, for axampla, was described above is blendad, it knesds An ingredient which limitation in particular does not have in the method of proparation of a

ange of one to 200 weight section and also ten to 100 weight section.

dissolved using a little suitable solvents, and a usual method of mixing may be adopted. A 1 liquid type, two-component type, or many liquid type compound can also be built and used by combining under ordinary temperature or heating using a mixer, a roll, a kneader, atc., or an ingredient is these ingredients sultably.

moisture, it will form network structure in three dimensions, and will harden it to a solid which has If a hardenability constituent of this invention is exposed into the atmosphere, by operation of

ubber-like elasticity.

In a hardenability constituent of this invention, various additive agents can be added if needed. Other ouring catalysts as an example of said additive for example (for example, tetravalent tin, divalent tin, eto.), Adhesive grant agents which adjust the tractive characteristics of a hardened material to

generate, such as a physical-properties regulator and a silane coupling agent, An antioxidant, radiosi nhibitor, an ultraviolet ray absorbent, a metal deactivator, anti-ozonant, light stabilizer, the Lynn system peroxide decomposition agent, lubricant, paints, a foaming agent, a photo-setting resin, a hixotropic grant agent, etc. are raised.

An example of such an additive is indicated in each gazette of UP,4-69858,B, UP,7-108928,B, UP,63-254149,A, and UP,64-22904,A, for example.

water resisting property, and electric ingulation resulting from a principal chain skeleton and it has Since a hardenability constituant of this invention has outstanding waatherability, heat resistance,

conveniently for electrical insulation materials, such as electric electronic component materials, such as a structural electros sealing compound, a sealing material for multiple glass, a solar cell rear-face sealing agent, pre-insulation an electric wire, material for cables, a binder, adhesives, a paint, infusion. a coating material, a sealing agent for rust prevention / water proof, etc. it is useful especially when used for adhesives, a structural elastic sealing compound, or a sealing material for siding. igh intensity and a physical-properties improvement effect of high elongation. It can use

Although working example and a comparative example explain this invention concretely below, this

 As caposed to isobuty/ane system polymer (Kanoka Corp. make, trade name EP505S/sobuty/ene system polymer / paraffin series process oil = 100/50) 150 weight section which has a reactive Working example 1-4, comparative example 1) invention is not limited to this.

ilicon group as an ingredlent, Epoxy resin (product [ made from Oil recovery Shell Epoxy ], trade name Epicoat 828) 5 weight section, Hydrogenation sipha-olefin oligomer (product [ made from

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weight section, Hindered amine light stabiliser (Sankyo Co., Ltd. make, trade name SANORU LS-770) carbonate (product [ made from Shiroishi Calcium ], trade name SOFUTON 3200) 40 weight section. Benzotriazol system ultraviolet ray absorbent (Ciba-Geigy Japan make, trade name tinuvin 327) 1 carbonate (Maruo Calcium Co., Ltd. make, trade name MC-5) 50 weight saction, Heavy-calcium-Maruo Calcium Co., Ltd. make, trada name SHIRETTSU 200) 50 weight section, Colloid calcium idemitsu Petrochemistry ], trada name PAO5004) 60 weight section. Colloid calcium carbonate Photo-satting rasin (Toagosei make, trade name ARONIKKUSU M-309) 3 waight section,

next — as the (B) ingredient — octyllo acid (2-ethylhexanoic acid) calcium salt (the Nihon Kagaku Sangyo Co., Ltd. make.) The trade name NIKKAOKU Chicks Ca 5% toluene solution was used as a respectively shown in Table 1 as a (C) ingredient and which could number/ of weight sections /hardening agent [ in / for the thing for which disteary! amine (the Kao Corp. make, Firmin D86) is measure, could use the spatula, and was stirred and mixed / working example 1 ]. vith a 3 paint roll, and was considered as base resin.

1010) 1 weight section, and water 5 weight section were measured respectively, and it often kneaded

weight section, hindered phenolic antioxidant (Giba-Geigy Japan make, trade name IRUGA NOx

used thing which shows lauryl amine in Table 1 respectively as (B) octylic acid (2-cthylhexanoic acid) - octylic acid (2-ethylhexanoic acid) iron (the Nihon Kagaku Sangyo Co., Ltd. make.) The numbar[ of weight excitors I-used thing which shows respectively lauryl annies (made by Wako Pure Obernical Industrial, Ltd.) in Table 1 as a trade name RIKKAORO URAGE 6 % 8 shouldes coulted, and a (C) ingredient is made inth working example 3. The number of weight excitoris I-used thing which requested in the working the support of weight excitoris I-used thing which the undergone is the working the support of the properties I and the III to be a support of the III to be III to be a support of the III to be a su which shows Firmin D86 in Table 1 respectively is made into working example 2, (B) as an ingredient 1 as a (B) ingredient as octylic acid (2-ethylhexanoic acid) titanium (3% toluene solution) and a (C) ingredient was made into working example 4. On the other hand, the number[ of weight sections ]ingredient — distearyl amine (the Kao Corp. make.) The number[ of weight sections ]-used thing bin (Japanese east transformation Make, trade name neo SUTAN U-28) and a (C) ingredient was here — as the (B) ingredient of this invention — naphthenic acid vansdlum (the Nihon Kagaku Sangyo Co., Ltd. make.) as a trade nama NIKKANAFU textile V 2% toluene solution and the (C)

mathod of the tensile adhesive property specimen to which this is specified JISA5758-1992 was filled These base resin and hardening agents were mixed by the ratio shown in Table 1, respectively, and before being filled up with the compound, the primer (the Toray Industries Dow Coming make, trade sluminum uses the alumite treatment aluminum of the 50x50x5-mm size based on JIS H4000 as a up. Care-of-health conditions were made into 23 \*\*x7 +50 \*\*x seven days. [ per day ] The used substrate. After purifying by methyl athyl ketone (made by Wako Pure Chamical Industries, Ltd.) what constructed the aluminum base material to H type in accordance with the manufacturing

made into the comparative example 1.

In accordance with the tensile coment test method of 5758 - 1992 N of JIS A, the examination was presented with H type sample obtained by the above-mentioned mothod on condition of speed-oftesting 50 mm/min among 23 \*\* and the thermostatic chamber of 50\*\*5% of humidity.

nama D-2) was dried and used undar ordinary temperature for spreading and 30 minutes.

fixed to 70% so that sample thickness might be set to 12 to 8.4 mm, and hesting a sample in 100 \*\* hot air drying equipment for one day, it released from compression and was neglected under the room The recovery was measured by the following methods. First, after making H type sample which ended the above-mentioned care of health immersed into 50 \*\* warm water for one day and taking it out, it temperature on the 1st. The thickness of the sample in this case was measured and the recovery to was neglected under the room temperature on the 1st. Subsequently, after having compressed and a compressed part was computed.

Time (teather-covered time) until it fills the same compound in an ointmant can simultaneously as a measure which eathmates hardenability and stretches a hide on the surface under 23 \*\* and the

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conditions of SNS of relative funding was measured. The one where learner-covered time is shorter leaves that the densality is high.

(10:8)

A result, is shown in Table I. The filled hardened material is that cohesive failure is atteen, and OF

A result, so shown in Table in front is a freature attee which on he asserbed for as a sealing material, and only the state which on he asserbed for as a sealing material.

[0139] [Teble 1]

				実施例1	実施例2	実施例3	実施例4	比較例1
主剤	(A) 成分	EP505S	phr			150		
		PAO5004	phr			60		
		シーレッサ200	phr			50		
		ソフトン3200	phr			40		
		MC-5	phr			50		
		IL" J-1828	phr			5		
		プロニックスM-309	phr			3		
		イルカ ノックス1010	phr			1		
		チヌヒ ン327	phr			1		
		サノールLS-770	phr			1		
		水	phr		,	5	,	
硬	(B) 成分	オクチル酸Ca	phr	5.7		i	1	
	1	ナフテン酸V	phr		9.0			
		オクチル酸Fe	phr		ł.	5.0		
化		オクチル酸Ti	bpt		i		4.5	
		オクチル酸Sn	phr					3.0
剤	(C) 成分	ジーステアリルアミン	phr	0.74	0.74		0.00	0.00
		ラウリルアミン	phr		<del> </del>	1.00	0.26	0.66
特性	硬化性	皮張り時間	時間	4	4	0.08	0.08	0,1
	H型引張特性	M 5 0	MPa	0.05	0.07			
		破断強度	MPa	0.45	0.64	0.27	0.34 580	0. 26 340
		破断伸び	%	770	760	440		CF
		破壊状態		CF	CF	CF	CF 29	
		復元率	- %	57	73	27	Z9	54

Jeng an isobutylene aystem polymer as an ingredient (A) as shown in Table 1 as a (B) ingredient. When disteary amine and leary's amine were used together for octyric acid calcium, naphthenic acid

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concerd time about advantage to compare for excepting control care to 12. Led 4, the Netherconcerd time about advantage the sear scenario as compared with the case where sorble add the large and any amine of the compared to the sear of the case where sorble and the case of the ca

CORTIZO weight section and útanium oxido (behihara Sangso Kaisha, Lick make, trade nama TIPAQUE
R-8280) 20 weight section, and strings mining was carried out for 10 minutes. Took out the minutum, and it kneeded once with 3 paint roll, and also checked that dried by decompression string at 120 we weight section and a dripping inhibitor (made in Kusumoto Chemicals.) The amount part of trade name for 2 hours, and water content docrossed to about 700 ppm with 61 planetary mixer again. After tonging a mixture, it selds and strained mixing of the mount part of dehydrator (Wippon Unions make, trade name A-17) displace was enried out for 15 mintes. Next, it added and string mixing of the aminoalbera coupling agent (Nippor Uhden make, trade name A-1720) 3 weight section was carried out for 17 minutes. The couplin and articular (Nigola Singpo Co. Ltd. make, trade name NIKCAQCO Glinks ZT-2122 knutuens eutlach) with the Nippor Nigola Singpo Co. Ltd. make, trade name NIKCAQCO Glinks ZT-2122 knutuens eutlach) within its the (B) ingrangent adjusted further beforehend CO). The number of vieight sections which shows lawryll amino finde by Wisto Pure Chem) which is an 100. The number of vieight sections which shows lawryll amino finde by Wisto Pure Chem) which is an ingredient in Table 2, and the mixed thing were edded, and decompression stirring mixing was performed for 5 minutes. The certridge made of paper (product made from the Showa round oylinder) mixture might not involve in a bubble, and I liquid mold-cunng nature constituent was obtained. What DISUPARON #6500 duplexs, benzotriazol system ultraviolet ray absorbent (Olba-Geigy Jepen make, trade name tinuvin 327) 1 weight section, and hindered emine light stabiliser (Sankyo Co., Ltd. make, trade name SANORU LS-770) 1 weight section were measured, and it mixed in \*\*\*\*\*\*, the colloid by which the cost was carried out was filled up with the aluminum for 1 liquid so that the obtained stirring at 120 \*\* with 5L pisnetary mixer beforehand for 2 hours it mixed to trade name Hakuenks (A) As a polyether system polymer which has reactant silicon as an ingredient. As opposed to MS used the amount part of dibutyfun diecetyl acetonate (Japanese sast transformation Meke, trads nemes U-220) duplaxs was made into the comparative example 2 instead of the mixture of said calcium carbonate (the product made from Shiraishi Industry.) which drisd this by decompression polymer S203 (made by Kaneka Corp.) 95 weight section, plasticizer (trade name PPG-3000) 55 naphthenic acid vanadium was used (working example 2). (Working example 5, comparative exemple 2)

After neglecting the above-mentioned I figuid molet-curing returns constituent under a room of the compensation of the compens

octylic soid zirconium and leuryl emina.

Unit 1. Since an adhesive property turned into the important characteristic as a 1 liquid mold-curing nature constituent, the adhesive property was checked using anodized sluminium and a vinyl chloride steel

the time of a fracture.

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with a 1 cm[ in width ] x length of about 3 cm, and it was recuparated for 23 \*\*x14 +50 \*\* x 14 days per day. The manual friction test was done after care of health, cutting an adhesion side deeply with a cutter furth, and the surface of the audistrate was observed. The filled hundred metarnal is that cohesive faither is shown, and OE in Table 2 is a fractura state searched for as a scaling material. plate. On each substrate which purified the surface by methyl ethyl ketone, I liquid mold-ouring nature constituent was placed from I liquid cartridge using commercial cancer to the crest shape

Depths hardenability took out the portion which has hardened the surface which filled in the 80-mmlong polyethylene tube 1 liquid mold-quiring nature constituent produced in working example 5, and was made at the tip of a tube in it at 16.5 mm in inside diameter on the day which the days to measure visited, and measured the hardened thickness with slide calipers.

[0143]

investigated.

Table 2

in order to check the practicality as a 1 liquid mold-curing nature constituent, where 1 liquid partridge is filled up with a constituent, it stored for two weeks in the hot air drying equipment which parried out the temperature control to 50 \*\*\*, and the depths hardenability after storage was A result is shown in Table 2. 0142

<b>&amp;</b>	成分	製品名	実施例5	比較例2	
	(A) 成分	\$203	95 55 120	95 55 120	重量部 支量部 查量部
	可数数	PPG3000			
	炭酸カルシウム	白舒莱CCR			
	光安定剤	サノールLS-770	1	1	重量部
	紫外線吸収剂	チヌピン327	1 2	1 2	推量部 重量部
	タレ防止剤	ディスパロン#6500			
	酸化チタン	タイペークR-820	20	20	東量部
	脱水劑	A-171	2	2	重量部
	接着性付与剂	A-1120	3	3	重量部
	(B)成分	オクチル酸ジルコニウム	8. 1		重量部
		U-220	]	2	重量部
	(C)成分	ラウリルアミン	1.4		重量部
引張機械特性	T	0. 27	0. 19	MPa	
	1	0.38	0. 31	MPa	
		0, 46	0.40	MPa	
	TE	0.84	0. 93	MPa	
	E	520	570	96	
14	陽探動	CF	CF	玻璃状態	
_		CF	CF	破壊状態	
性	深部硬化性	23℃×1週間	7. 7	10. 6	mm
_		23℃×2週間	12.2	15. 6	mm
安定性	深部硬化性	23℃×1週間	7. 2	10.8	mm
0℃×2週間貯蔵)		23℃×2週間	12. 0	16. 4	mm

Use polyoxypropylene triol of the molecular weight 3,000 [ about ] as an initiator, and propylane oxide working example 5, (B) By using the lauryl amine which acts the carboxylic acid zirconium salt which acts as a corcatalyst as a (C) ingredient further as a silanol condensation catalyst as an ingredient, molecular weight about 26,000 (polystyrane reduced molecular weight in which the column measured the solvent using THF using the TOSOH TSK-GEL H type using TOSOH HLC-8120GPC as a liquid-As opposed to the polyether system polymer which serves as the (A) ingredient of this invention in adhesive property were revealed and it checked that I liquid mold-curing nature constituent which is polymerized in a zinc hexa oyanocobaltate glyme complex compound catalyst, Number average dibutyltin diacetyl acetonate as a tetravalent tin catalyst, almost comparable elongation and an Although hardenability was slightly inferior as compared with the comparative example 2 using may be sufficient for practical use was obtained (Table 2). (Synthetic example 1)

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http://www4.ipdl.inpit.go.jp/cgi-bin/tran\_web\_cgi\_ejje?atw\_u=http%3A%2F%2Fwww4.ipdl.i.. 2010/05/06

obypropylena oxide of the number averaga molecular weight 26,000 [ about ] which is an allyl group.

szeotropically at 90 \*\* and distilling off hexane under decompression. On the other hand, after adding conversion) 1, 7.0 g of dimethoxymethylsilane was dropped. After making the mixed solution react at 30micro of platinum divinyl dislloxane complex (it is 3% of the weight of xylene solution by platinum 30 \*\* for 2 hours, unreacted dimethoxymethylsilane was distilled off under decompression and the polypropylene oxide and 10 g of hexane which were obtained above to 1L autoclave, dehydrating reactive silicon group content polyoxyalkylene series polymer (A-1) was obtained. The number The nitrogen purge was carried out, after having added 500 g of allyl end 3 organic-functions average molecular weight of the obtained polymer (A-1) was about 26,000. The silyl group

introduction rate was measured by the following methods by  ${}^{\dagger}\mathrm{H-NMR}$  (it measures in a CDCI $_{\mathrm{a}}$  solvent polypropylene oxide main ohain of the sily/ and polypropylene oxide (A-I) after a hydrosilylation reaction. The relative value of the peak integral value of the proton (near  $\mathrm{CH}_3^{\mathrm{c}}\mathrm{CH}_2^{\mathrm{c}}\mathrm{-CH}_2^{\mathrm{c}}$ 0.6ppm) of the methylens group combined with the silicon atom of the end silyl group: Two \*\* et al., using JEOL JNM-LA400), Relative-value:1 of the peak integral value of the allyl end proton (near polypropylene oxide main chain of said allyl end 3 organic-functions polypropylene oxide before a nydrosilylation reaction. Receive the peak integral value of the CH<sub>3</sub> group (near 1.2 ppm) of the CH<sub>2</sub>=CH-CH<sub>2</sub>-:5.1 ppm) to the peak integral value of the CH<sub>3</sub> group (near 1.2 ppm) of the a silyl group introduction rate (\*\*2.) /\*\*1. It was 78%.

4fter attaching a three-way cock to the resisting pressure glass container of 2L and carrying out the sthyloyclohexane (thing dry by neglecting 1 or more night with the molecular sleves 3A), and 787.5 ml of toluene (thing dry by neglecting 1 or more night with the molecular sieves 3A), p-DGC (the nitrogen purge of the inside of a container to it, Using an injector, in a container 262.5 ml of Synthetic example 2)

following compound (A)) 4.85g (21.0mmol) was added.

[Formula 11]

was made decompression using the vacuum pump. After opening the needle valve and introducing an group was performed to molecular chain terminals. After adding allyl trimethylsilane and 200 ml of water washed [ 120 minutes ] the reaction solution 4 times, the allyl and isobutylone system polymer Vext, the resisting pressure glass liquefied gas extraction pipe with a needle valve containing 438 ml sobutylene monomer in a polymerization vessel from a liquefied gas extraction pipe, the inside of a 5.15 mol) of isobutylene monomers was connected to the three-way cock, and after attaching the colymerization vessel all over dry ice / ethanol bus of -70 \*\* and cooling, the inside of a container istrachloride was added, and the polymerization was started. 70 minutes after the polymerization start, 7.20 g (63.0mmol) of allyl trimethylsilane was added, and the introduction reaction of the allyl book. Next, 0.72 g (7.7mmol) of 2-methylpyridine was added. Next, 10.58 ml (96.5mmol) of trianium container was returned to ordinary pressure by introducing nitrogen from one side in a three-way vas obtained by distilling off a solvent.

subsequently, the allyl and isobutylene system polymer 200g obtained in this way, the paraffin-base process oil (the Idemitsu Kosan make.) which is a hydrocarbon system plasticizar After mixing trade nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran\_wab\_ogi\_ejje?atw\_u=http%3A%2F%2Fwww4.ipdl.i.. 2010/05/06

JP,4150220,B [DETAILED DESCRIPTION]

equivalent was added [methyl dimethoxysilane ] for 2.4 Eq and a platinum (vinyl siloxano) complex to FT-IR (Shimadzu IR-408) performed reaction pursuit, and the absorption based on the olefin of 1640 the allyl group of an end to the allyl group of an end, and the hydrosilylation reaction was performed. name Diana process PS-32 100g and carrying out temperature up to about 75 \*\*, the 7.5×10<sup>-5</sup> "disappeared in about 20 hours.

2/1 of PS-32 which is the isobutylene system polymer and plasticizer which have a reactive silicon group in the both ends of the target chain of the mixtures (A-2) of the weight ratio were obtained. n this way, if the obtained polymer is messured by the GPC method (it was considered as the liquid-sending system and, as for the solvent, the column used CHCl<sub>3</sub> using Shodex K-804 using LOModule! nade from Waters), The number average molecular weight was 17,800 and Mw/Mn (ratio of weight

Varian Gemini300) The proton which belongs to each structure by measurement in CDGI3 (the proton of initiator origin: 6.5–7.5 ppm). The methyl proton combined with the sillicon atom of polymar-terminal origin: As a result of measuring and measuring the intensity of 0.0–0.1 ppm and the resonance signal of methoxy proton:3.4 - 3.5, the end silyl functional group number Fn (number of the silyl group per average molecular weight to a number average molecular weight) was 1.23. <sup>1</sup>H-NMR (using

(A) As an ingredient, various additiva agents were measured, raspactively, and it often kneaded with a polyoxyalkylene series polymer (A-1) obtained in the synthetic example 1, and was considered as 3 paint roll according to the formula shown in Table 2, using the reactive silicon group content (Working example 8-15, comparative example 3)

ona molecule of isobutylena polymar) was 1.76.

the numbers of mois of the metal atom containing the number of addition parts of the various carboxylic soid metal salt of the (B) ingredient to become the same here. The mold about 3 mm thick the time of a dumbbell fracture (Tb), and the elongation at tha time of a dumbbell fracture (Eb) were (G) ingredient, the spatula was used for it, and it stirred and mixed for 3 minutes. It was made for all specimen specified to JIS K 6301 was pieraed, and the tensile test was carried out in the autograph (tension speed 200 mm/min). The modulus (MSO) in the time of being extended 50%, the intensity at Next, as a (B) ingredient which is a silanol condensation catalyst, lauryl amine was further measured for the various carboxylic acid metal salt shown in Table 1 to the above-mentioned base rosin as a was used and filled up with the spatula after mixing, and care of health on 23 \*ex.3 +50 \*ex, the 4th was performed. [ per day ] From the obtained hardened material sheet, the No. 3 type dumbbell was performed. [ massured.

The combination presantation of base resin, a curing catalyst, etc. and the physical-properties evaluation result of the hardened material obtained from it are shown in Table 3.

The evaluetion result of the hardened state five days after the combination presentation of bese resin, a curing cetelyst etc. is shown in Table 4. What the surface had hardened O in front for five days afterward is shown, and it is shown that x had not hardened five days after. [Teble 4] [0156]

[0155]

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Next, the verious carboxylic scid metal salt shown in Table 4 as a (B) ingredient which is a silanol

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ngredient the reactive silicon group obtained in the synthetic example 2, various additive agents were

A) Using the mixture (A-2) of the isobutylene system polymer end plasticizer which have as an

Working example 16-28, comparative example 4) tigh elongation and high intensity were shown.

physical properties is larger.

measured, respectively, and it often kneaded with a 3 peint roll according to the formula shown in

Table 4, and was considered as base resin.

comparative example 3 using 2-ethylkexanolo acid tin as a silanol condensation catalyst as shown in Table 3, the value of Tb (breaking strength) and Eb (elongation after fracture) of hardened material

Then the various carboxylic acid metal salt of working example 6-15 is used compered with the

JP,4150220,B [DETAILED DESCRIPTION]

When the various carboxylic acid metal salt of working example 16-28 is used as shown in Table 4, in

prite of having used the silanol condensation catalyst of the non-tin series, the surface has hardened

Practical hardenability was shown.

On the other hand, when the carboxylic acid zinc of the comparative example 4 was used, nardenability had not hardened five days after bad,

parboxylic acid zirconium, and a hardenability [\*\* and others ] constituent, In spite of being a non-tin nolecule, (B) Carboxylic acid calcium, carboxylic acid vanadium, carboxylic acid iron, Carboxylic acid tranium, carboxylic acid potassium, carboxylic acid barium, Carboxylic acid manganese, carboxylic As mentioned above, the organic polymer which has at least one reactive silicon group in the (A) soid nickel, carboxylic soid cobalt, one or more sorts of carboxylic soid metal salt chosen from a series catalyst, practical hardenability is shown, and it turns out that hardened material physical

Constituent using the trimethoxysilyl group as a reactive silicon group) properties are also fitness (high elongation and high intensity).

terminals as a reactive silicon group, a cure rate will become large from tha polymer of the synthetic or example, the same hardenability constituent as working exampla 6-15 can be prepared using the polymer indicated for the example 1 of manufacture of JP,H11-12480,A. The tack frae time of this mathyl dimethoxy silyl group. Such a polymer is indicated to JP,H11-12480,A or JP,2001-72855,A. constituent is shorter than working example 6-15. The same hardenability constituent as working example 6-15 can be prepared using the polymer indicated for the example 1-4 of manufacture of if a trimethoxysilyl group uses the polyoxyalkylane series polymer which exists in molecular chain Therefore, a catalyst amount can be lessened, if cure time is made into the same grade and the JP,2001-72855,A. The tack free time of this constituent is shorter than working example 6-15. example 1. The direction of a trimethoxysilyl group of this is bacause reactivity is larger than a polymer which has the above-mentioned trimethoxysilyl group will be used.

the mixture of the polymer which has a trimethoxysilyl group, and the polymer which has a methyl material are freely controllable. For example, the hardenability constituent of working example 6-15 can be prepared using the polymer which mixed the polymer which has a trimethoxysilyl group, and dimethoxy silyl group is used as a polymer, cure time and the physical properties of a hardened the polymer which has a methyl dimethoxy silyl group by the weight ratio of 1:10-10:1.

Norking example when the polymer which has a trimethoxysily! group is used is shown below Synthetic example 3)

distribution Mw/Mn=1.20 as 19g of gamma-isocyanate propyltrimethoxysilane (Nippon Unicar make ransformation [ Japanese east ]) is added, it reacted at 90 \*\* until the isocyanate group was no compound catalyst. It polymerizes. The obtained polypropylene oxide. Use and to the compound number average molecular weight 17,000 and the polyoxypropylane diol 1000g of molecular-weig he inside of bottom of N, atmosphere 1L autoclave, According to a composite matal complex Y-5187), and a catalyst, 0.05 g of dibutyl tin screw isooctylthioglycolate (made in [ U-360 ]

ngredients according to the formula shown in Table 5 using the polyoxyalkylene series polymer (A-3) which has the trimethoxysilyl group obtained in the synthetic example 3, (C) Lauryl amine which is an ngredient was measured, respectively, the spatula was used, and it stirrad and mixed for 30 seconds. It was made for all the numbers of mols of the metal atom containing tha number of addition parts of surface was lightly pressed down with the apatula after mixing, and time (laather-covered time) until (A) The polyoxyalkylene series polymer (A-1) which has as an ingredient the methyl dimethoxy silyl group obtained in the synthetic example 1. The various carboxylic acid metal salt which is the (B) the various carboxylic acid metal salt of the (B) ingredient to become almost the same here. The obtained. (Working example 29-32)

a constituent atops adhering at the tip of a apatula was measured.

[0161] 0160

An evaluation result is shown in Tabla 5.

Table 5

(C) 成分

(A) 成分

キサン酸鉄のミネラルスピリット溶液、 サン酸カルシウムのミネラルスピリット溶液、金属(Ca)

ニッカオクチックスカルシウム5%(T) 皮張り時間

組成(重量部)

ラウリルアミン (23℃)

A - 1

日本化学産業(株)

実施例

100

6.6

0.66

含有量:5%

29

100

6.6

0.66

41min 金属(Fe)

31

100

5.6 0.66 32

100

5.6

0.66

polyoxypropylene (A-3) by which the trimethoxysilyl group was introduced into about 80% of ends was longer detected in IR under the nitrogen air current in this, and the reactive silicon group content

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As ahown in Table 5, the polyoxyalkylane series polymer (A-3 working example 30 and 32) which has a trimethoxysilyl group had the cure rate quicker than the polyoxyalkylene series polymer (A-1:

working example 29 and 31) which has a methyl dimethoxy silyl group.

example 3. The tack frae time of this constituent has short cure time, and good physical properties The same hardenability constituent as working example 6–15 can be prepared using the polyoxyalkylene series polymer (A–3) which has the trimethoxyalkyl group obtained in the synthetic are acquired.

The same hardenability constituent as working example 6-15 can be prepared using the constituent which used together reactive silicon group containing organic polymer and an epoxy resir. When this constituent is used, the manifestation of adhesive strength is quick. Constituent which used the epoxy resin together)

Effect of the Invention] 0163

revailing practical hardwaielity and abbility, the hardward material obtained shows the outstanding manchanical projects programmed in the manchanical projects programmed the programmed projects programmed the programmed programmed to the programmed to the programmed to the carbody calculate. Therefore, when the carbody calculate transity used conventionably is used as a curring catalyst. Therefore, the hardwaieling constituent of this invention is very useful as ventuue elastenners, such as a sealing tranium, carboxylio acid potassium, carboxylic acid barium, The hardenability constituent containing (A) The organic polymer which has the hydroxyl group or hydrolytic basis combined with the silicon stom, and has at least one silicon content group which can construct a bridge by forming a siloxane bond, (B) Carboxylic acid calcium, carboxylic acid vanadium, carboxylic acid iron, Carboxylic acid one or more sorts of carboxylic acid metal salt which it comes to choose out of carboxylic acid manganese, carboxylic acid nickel, carboxylic acid cobalt, and a carboxylic acid zirconium, While material, adhesives, a binder.

Translation done.